



## Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-278



### **CH-47F Improved Cargo Helicopter (CH-47F)**

As of FY 2017 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance  
ACAT - Acquisition Category  
ADM - Acquisition Decision Memorandum  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
\$B - Billions of Dollars  
BA - Budget Authority/Budget Activity  
Blk - Block  
BY - Base Year  
CAPE - Cost Assessment and Program Evaluation  
CARD - Cost Analysis Requirements Description  
CDD - Capability Development Document  
CLIN - Contract Line Item Number  
CPD - Capability Production Document  
CY - Calendar Year  
DAB - Defense Acquisition Board  
DAE - Defense Acquisition Executive  
DAMIR - Defense Acquisition Management Information Retrieval  
DoD - Department of Defense  
DSN - Defense Switched Network  
EMD - Engineering and Manufacturing Development  
EVM - Earned Value Management  
FOC - Full Operational Capability  
FMS - Foreign Military Sales  
FRP - Full Rate Production  
FY - Fiscal Year  
FYDP - Future Years Defense Program  
ICE - Independent Cost Estimate  
IOC - Initial Operational Capability  
Inc - Increment  
JROC - Joint Requirements Oversight Council  
\$K - Thousands of Dollars  
KPP - Key Performance Parameter  
LRIP - Low Rate Initial Production  
\$M - Millions of Dollars  
MDA - Milestone Decision Authority  
MDAP - Major Defense Acquisition Program  
MILCON - Military Construction  
N/A - Not Applicable  
O&M - Operations and Maintenance  
ORD - Operational Requirements Document  
OSD - Office of the Secretary of Defense  
O&S - Operating and Support  
PAUC - Program Acquisition Unit Cost

PB - President's Budget  
PE - Program Element  
PEO - Program Executive Officer  
PM - Program Manager  
POE - Program Office Estimate  
RDT&E - Research, Development, Test, and Evaluation  
SAR - Selected Acquisition Report  
SCP - Service Cost Position  
TBD - To Be Determined  
TY - Then Year  
UCR - Unit Cost Reporting  
U.S. - United States  
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

## Program Information

**Program Name**

CH-47F Improved Cargo Helicopter (CH-47F)

**DoD Component**

Army

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**Date Assigned:** July 31, 2015

## References

**SAR Baseline (Production Estimate)**

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated November 22, 2004

**Approved APB**

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated April 22, 2010

## Mission and Description

The CH-47F Improved Cargo Helicopter (CH-47F) supports the Army's requirement to be strategically responsive across the full spectrum of operations. It will provide continued support, coverage, and sustainment of Maneuver, Fire Support, Air Defense, and Survivability mission areas. Its mission is transportation of ground forces, Class III/Class V supplies, and other battle critical cargo in support of all future contingencies. The CH-47F enables the Army to support the rapid response capability necessary for forcible and early entry contingency missions, as well as tactical and operational nonlinear, noncontiguous, simultaneous, or sequential operations, which will be characteristic of future operations.

The CH-47F is a future force system that supports the Army Vision. The CH-47F is a twin-turbine, tandem-rotor, heavy-lift transport helicopter with a useful payload of up to 25,000 pounds. The CH-47F's lift capability is invaluable as the Army transforms from a heavy-division dominated force to a more deployable medium weight force focused toward 21st Century Army requirements. The CH-47F, with its upgraded engines, the Common Avionics Architecture System (CAAS) with advanced avionics, monolithic machined frame components and airframe modifications, will reduce operating costs and continue to be a National asset providing peacetime disaster relief and wartime service to this country for another 20 years.

The CH-47F program fills the Army's Aviation Transformation Chinook requirement for upgraded aircraft and is comprised of both remanufactured and new aircraft. The total remanufactured aircraft will consist of CH-47Fs and MH-47Gs. The MH-47G configuration replaces the current MH-47E/Ds for Special Operations Forces. The CH-47F program installs a new digital cockpit, incorporates all new airframe components, and modifies the aircraft to reduce vibration. The CAAS digital cockpit will provide future growth potential. It includes a digital data bus that permits installation of enhanced communications and navigation equipment for improved situational awareness, mission performance, and survivability. New airframe structural components and modifications will reduce harmful vibrations, improving O&S efficiency and crew endurance. Other airframe modifications reduce the time required for aircraft tear down and build-up during C-5/C-17 deployment by 60 percent. These modifications significantly enhance the CH-47F's strategic deployment capability.

## Executive Summary

The CH-47F program is in FRP and remains on schedule with 406 CH-47F aircraft on contract (234 New Build and 172 ReNew). The first lot of the Multiyear II contract (Lot 11) was awarded on June 10, 2013, the second lot (Lot 12) was awarded on December 26, 2013, and the third lot (Lot 14) was awarded on March 13, 2015. The first Multiyear II delivery occurred ahead of schedule on January 29, 2015. A total of 409 aircraft have been delivered as of January 31, 2016 (two RDT&E aircraft, 340 CH47F and 67 MH-47G). The FY 2013 Overseas Contingency Operations (OCO) funds of \$231.3M were received in June 2013 for six CH-47F aircraft. The FY 2014 OCO funds of \$386.0M were received in March 2014 for ten CH-47F aircraft. On December 23, 2014, an ADM resulting from a Configuration Steering Board increased the CH-47F Army Acquisition Objective from 533 to 542. In January 2015, \$347.4M in FY 2014 OCO funds for nine aircraft was rescinded.

The CH-47F Product Manager's Office (PMO) is tasked by the Department of the Army to continue CH-47F training of Active Component (AC), Army National Guard (ARNG), and U.S. Army Reserve (USAR) Combat Aviation Brigades (CAB) via New Equipment Training (NET) through FY 2017. The CH-47F NET teams have completed fielding and training of all 13 AC CABs, the Honduras detachment, ten of 13 ARNG CABs and the USAR CABs. The PMO supports multiple contractor NET teams who provide concurrent training at separate locations.

The NET for the Washington/Oregon ARNG CAB was completed on September 30, 2015. The NET for the Illinois/South Carolina ARNG CAB was completed on November 20, 2015. The NET for the Mississippi/Florida ARNG CAB was completed on November 20, 2015. All ARNG NET was conducted in Savannah, Georgia.

The NET for the 2nd USAR CAB was completed on April 27, 2015. The NET for the 3rd USAR CAB was completed on July 1, 2015. This completed fielding and NET to the USAR CABs.

Additionally, the NET completed training and fielding of the first Multiyear II configured aircraft to the 1st Armored Division in July 2015, the 1-214th Aviation Regiment (Germany) in August 2015, and is currently fielding the 3rd Infantry Division with fielding scheduled to be completed in 3rd Quarter FY 2016.

Two CH-47F units are currently deployed to Operation Freedom Sentinel and Operation Inherent Resolve.

The CH-47F PMO has completed installation of Infrared Suppression System, Advanced Threat Infrared Counter Measures, and other Army-directed modifications at the Millville, New Jersey modification center.

There are no significant software-related issues with this program at this time.

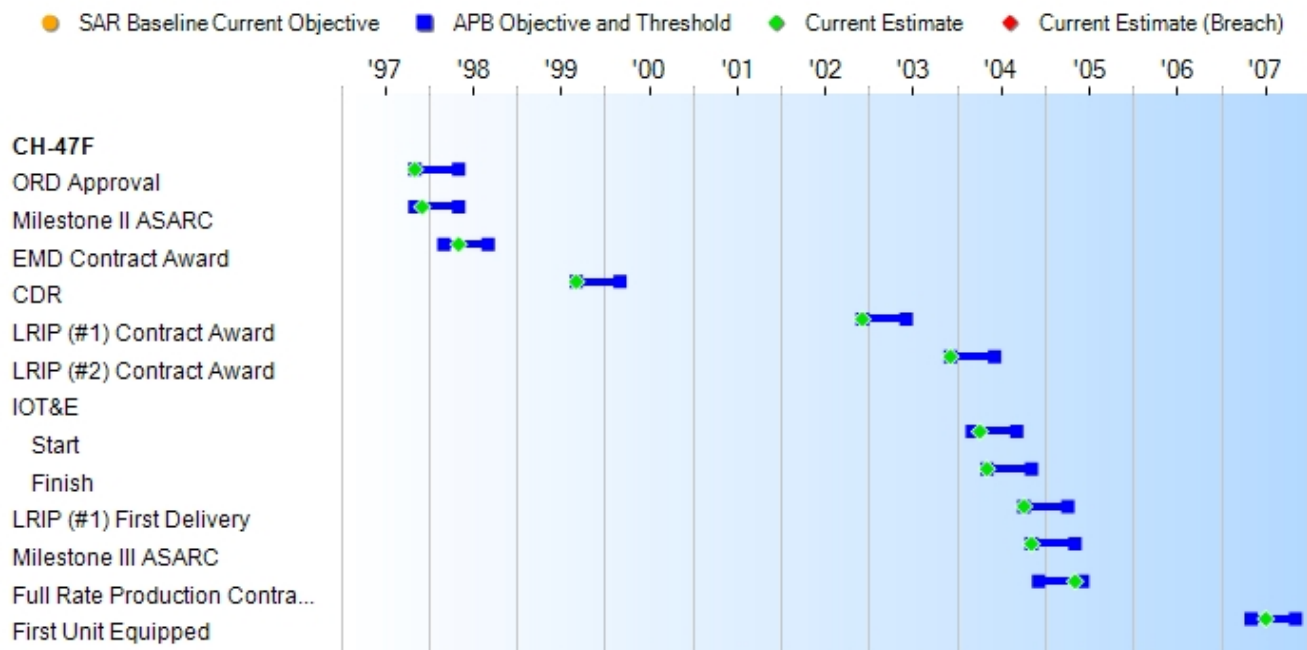
Threshold Breaches

APB Breaches		
Schedule		<input type="checkbox"/>
Performance		<input type="checkbox"/>
Cost	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
O&S Cost		<input type="checkbox"/>
Unit Cost	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None



## Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
ORD Approval	Nov 1997	Nov 1997	May 1998	Nov 1997
Milestone II ASARC	Nov 1997	Nov 1997	May 1998	Dec 1997
EMD Contract Award	Mar 1998	Mar 1998	Sep 1998	May 1998
CDR	Sep 1999	Sep 1999	Mar 2000	Sep 1999
LRIP (#1) Contract Award	Dec 2002	Dec 2002	Jun 2003	Dec 2002
LRIP (#2) Contract Award	Dec 2003	Dec 2003	Jun 2004	Dec 2003
IOT&E				
Start	Mar 2004	Mar 2004	Sep 2004	Apr 2004
Finish	May 2004	May 2004	Nov 2004	May 2004
LRIP (#1) First Delivery	Oct 2004	Oct 2004	Apr 2005	Oct 2004
Milestone III ASARC	Nov 2004	Nov 2004	May 2005	Nov 2004
Full Rate Production Contract Award	Dec 2004	Dec 2004	Jun 2005	May 2005
First Unit Equipped	May 2007	May 2007	Nov 2007	Jul 2007

**Change Explanations**

None

**Notes**

The IOT&E is a single effort divided into two phases. Phase I, completed in May 2004, supported FRP. Phase II, completed in June 2007, supported First Unit Equipped.

**Acronyms and Abbreviations**

ASARC - Army Systems Acquisition Review Council

CDR - Critical Design Review

IOT&E - Initial Operational Test and Evaluation

## Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
Self-deploy w/30 min fuel reserve (nm)				
1260	1260	1056	1130	1130
Transport 16,000 lbs of internal/external cargo (nm)				
100	100	50	56	56
Transport combat equipped troops:				
Number of Troops				
44	44	31	31	31
Range (nm)				
150	150	100	150	150
Reliability:				
MTBEMA (flt hrs)				
3.5	3.5	3.3	4.13	3.3
Maintenance:				
Total Maintenance Ratio (mmh/flt hr)				
9.2	9.2	9.8	4.9	9.8

### Requirements Reference

ORD Revision 4 dated January 26, 2006

### Change Explanations

None

### Notes

Per new guidance from DoD Acquisition Visibility, O&S/Sustainment Reporting Functional Description Document Version 3.0, the definitions of Demonstrated Performance and Current Estimate are:

**Demonstrated Performance:** The Demonstrated Performance section of Reliability and Maintenance is actual data derived from the current Aviation and Missile Research Development and Engineering Center CH-47 RAM Report.

**Current Estimate:** The Current Estimate represents anticipated performance when all units are fielded. The Current Estimates for Reliability and Maintenance correspond to the CH-47F ORD values.

CH-47F Operational Test was completed on June 4, 2007; RAM data final scoring conference completed on June 5, 2007.

**Acronyms and Abbreviations**

flt - flight

hr(s) - hour(s)

lbs - pounds

min - minute

mmh - maintenance man hour

MTBEMA - Mean Time Between Essential Maintenance Actions

nm - nautical miles

RAM - Reliability, Availability, Maintainability

w/ - with

## Track to Budget

### RDT&E

Appn	BA	PE	
Army	2040	07	0203744A
	Project	Name	
	D430	Aircraft Modifications/Product Improvement Program/Improved Cargo Helicopter	
			(Shared) (Sunk)

### Procurement

Appn	BA	PE	
Army	2031	01	0210104A
	Line Item	Name	
	A05008	CH-47 NEW BUILD	
			(Shared)
Army	2031	01	
	Line Item	Name	
	A05105	CH-47 SLEP	
			(Shared)
Army	2031	02	
	Line Item	Name	
	AA0252	CH-47 CARGO HELICOPTER MODS	
			(Shared) (Sunk)

### Notes

Line Item AA0252 is shared with CH-47D Modifications applied to currently fielded CH-47D aircraft. The CH-47F funding lines changed starting in FY 2010 to CH-47 Helicopter (A05101) - a parent (roll-up) of New Build and Service Life Extension Program (SLEP), CH-47 SLEP (A05105), and CH-47 New Build (A05008). CH-47F funding for FY 2009 and prior resides on the previously combined AA0252 line. A05008 and A05105 fund the CH-47F aircraft and post-production modification efforts.

## Cost and Funding

### Cost Summary

Total Acquisition Cost							
Appropriation	BY 2005 \$M			BY 2005 \$M	TY \$M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	179.7	183.3	201.6	183.3	171.0	171.6	171.6
Procurement	10435.1	11869.0	13055.9	12826.9	11976.4	13464.6	14702.6
Flyaway	--	--	--	12072.0	--	--	13841.4
Recurring	--	--	--	11732.8	--	--	13509.0
Non Recurring	--	--	--	339.2	--	--	332.4
Support	--	--	--	754.9	--	--	861.2
Other Support	--	--	--	703.0	--	--	800.7
Initial Spares	--	--	--	51.9	--	--	60.5
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	10614.8	12052.3	N/A	13010.2	12147.4	13636.2	14874.2

#### Confidence Level

Confidence Level of cost estimate for current APB: 50%

The Confidence Level of the CH-47F APB cost estimate, which was approved on April 22, 2010, is 50% in accordance with Army SCP policy.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E		2	2
Procurement	510	523	543
Total	512	525	545

## Cost and Funding

### Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY\$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	171.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	171.6
Procurement	12691.7	1103.1	565.0	342.8	0.0	0.0	0.0	0.0	14702.6
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	12863.3	1103.1	565.0	342.8	0.0	0.0	0.0	0.0	14874.2
PB 2016 Total	12863.3	1123.1	710.7	342.8	0.0	0.0	0.0	0.0	15039.9
Delta	0.0	-20.0	-145.7	0.0	0.0	0.0	0.0	0.0	-165.7

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	473	39	22	9	0	0	0	0	543
PB 2017 Total	2	473	39	22	9	0	0	0	0	545
PB 2016 Total	2	473	39	27	9	0	0	0	0	550
Delta	0	0	0	-5	0	0	0	0	0	-5

## Cost and Funding

### Annual Funding By Appropriation

Annual Funding								
2040   RDT&E   Research, Development, Test, and Evaluation, Army								
Fiscal Year	Quantity	TY \$M						Total Program
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support		
1995	--	--	--	--	--	--	--	2.7
1996	--	--	--	--	--	--	--	4.3
1997	--	--	--	--	--	--	--	16.6
1998	--	--	--	--	--	--	--	22.6
1999	--	--	--	--	--	--	--	23.8
2000	--	--	--	--	--	--	--	27.1
2001	--	--	--	--	--	--	--	37.7
2002	--	--	--	--	--	--	--	17.7
2003	--	--	--	--	--	--	--	3.3
2004	--	--	--	--	--	--	--	7.3
2005	--	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--	7.0
2007	--	--	--	--	--	--	--	1.5
Subtotal	2	--	--	--	--	--	--	171.6



Annual Funding 2040   RDT&E   Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	BY 2005 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1995	--	--	--	--	--	--	3.1
1996	--	--	--	--	--	--	4.8
1997	--	--	--	--	--	--	18.4
1998	--	--	--	--	--	--	24.9
1999	--	--	--	--	--	--	25.9
2000	--	--	--	--	--	--	29.1
2001	--	--	--	--	--	--	39.9
2002	--	--	--	--	--	--	18.5
2003	--	--	--	--	--	--	3.4
2004	--	--	--	--	--	--	7.3
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	6.6
2007	--	--	--	--	--	--	1.4
Subtotal	2	--	--	--	--	--	183.3

Annual Funding 2031   Procurement   Aircraft Procurement, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	41.6	41.6	17.7	59.3
2002	--	--	--	45.5	45.5	14.9	60.4
2003	14	353.8	--	224.8	578.6	18.6	597.2
2004	16	227.8	--	--	227.8	23.2	251.0
2005	30	700.3	--	4.6	704.9	15.0	719.9
2006	24	461.4	--	2.6	464.0	40.6	504.6
2007	43	1121.7	--	13.3	1135.0	88.3	1223.3
2008	53	1253.8	--	--	1253.8	60.4	1314.2
2009	52	1216.3	--	--	1216.3	57.3	1273.6
2010	39	852.2	--	--	852.2	76.1	928.3
2011	49	1198.9	--	--	1198.9	113.7	1312.6
2012	48	1352.5	--	--	1352.5	20.0	1372.5
2013	44	1104.0	--	--	1104.0	98.9	1202.9
2014	29	824.2	--	--	824.2	87.7	911.9
2015	32	896.7	--	--	896.7	63.3	960.0
2016	39	1073.8	--	--	1073.8	29.3	1103.1
2017	22	530.6	--	--	530.6	34.4	565.0
2018	9	341.0	--	--	341.0	1.8	342.8
Subtotal	543	13509.0	--	332.4	13841.4	861.2	14702.6

Annual Funding 2031   Procurement   Aircraft Procurement, Army							
Fiscal Year	Quantity	BY 2005 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	43.9	43.9	18.7	62.6
2002	--	--	--	47.4	47.4	15.5	62.9
2003	14	360.5	--	228.9	589.4	19.0	608.4
2004	16	225.8	--	--	225.8	22.9	248.7
2005	30	675.4	--	4.4	679.8	14.5	694.3
2006	24	433.2	--	2.4	435.6	38.2	473.8
2007	43	1032.4	--	12.2	1044.6	81.4	1126.0
2008	53	1136.0	--	--	1136.0	54.7	1190.7
2009	52	1086.4	--	--	1086.4	51.2	1137.6
2010	39	748.2	--	--	748.2	66.8	815.0
2011	49	1033.8	--	--	1033.8	98.0	1131.8
2012	48	1146.8	--	--	1146.8	16.9	1163.7
2013	44	919.7	--	--	919.7	82.3	1002.0
2014	29	676.2	--	--	676.2	72.0	748.2
2015	32	724.6	--	--	724.6	51.2	775.8
2016	39	856.6	--	--	856.6	23.4	880.0
2017	22	415.4	--	--	415.4	26.9	442.3
2018	9	261.8	--	--	261.8	1.3	263.1
Subtotal	543	11732.8	--	339.2	12072.0	754.9	12826.9

Cost Quantity Information		
2031   Procurement   Aircraft Procurement, Army		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2005 \$M
2001	--	--
2002	--	--
2003	14	348.3
2004	16	224.9
2005	30	672.1
2006	24	415.6
2007	43	1037.8
2008	53	1133.7
2009	52	1077.0
2010	39	746.7
2011	49	1016.7
2012	48	1092.3
2013	44	948.9
2014	29	653.3
2015	32	715.3
2016	39	874.8
2017	22	513.6
2018	9	261.8
Subtotal	543	11732.8

## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	5/19/1998	8/19/2002
<b>Approved Quantity</b>	30	30
<b>Reference</b>	Milestone II ADM	LRIP ADM
<b>Start Year</b>	2003	2003
<b>End Year</b>	2004	2004

Milestone II and LRIP ADMs specified LRIP quantity as "up to 30 aircraft."

The FY 2003 PB funded 23 LRIP aircraft (7 in FY 2003 and 16 in FY 2004). Of these, 1 aircraft in FY 2003 was a CH-47F and the remaining 22 were MH-47G.

## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Netherlands	11/12/2015	14	492.5	An additional five aircraft, with a value of \$151.3M, were added to this case in September 2015.
United Arab Emirates	6/28/2011	16	598.7	
Turkey	7/9/2010	11	403.3	
Australia	3/19/2010	7	249.0	

### Notes

The sale dates above are Letter Of Acceptance signature dates. The costs are for the aircraft only.

The CH-47F aircraft capabilities and operational successes in Operation Iraqi Freedom and Operation Enduring Freedom generated interest and inquiries from foreign CH-47D customers. The Common Avionics Architecture System (CAAS) cockpit provides pilot workload reductions and enhanced flight capabilities through flight control coupling. Foreign customers requesting configuration modifications to the aircraft which change the CAAS software, aircraft handling qualities, mission equipment or performance will incur non-recurring and recurring costs to develop, test, qualify, certify, field, and maintain the software and related hardware as well as increase the lead time to deliver the modified CH-47F. The FMS helps ensure a robust supply chain and industrial base.

## Nuclear Costs

None

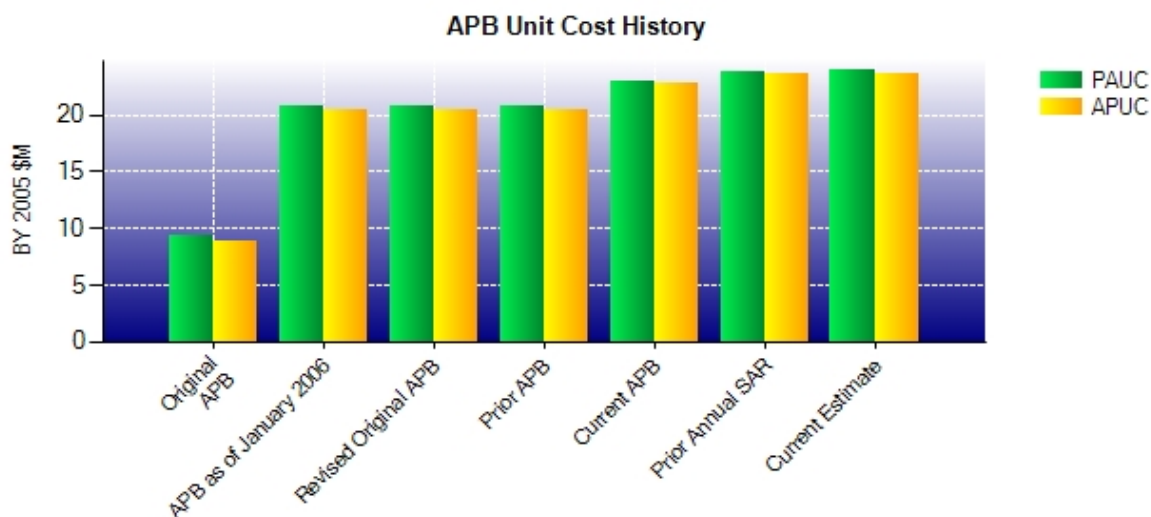
## Unit Cost

### Unit Cost Report

Item	BY 2005 \$M	BY 2005 \$M	% Change
	Current UCR Baseline (Apr 2010 APB)	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	12052.3	13010.2	
Quantity	525	545	
Unit Cost	22.957	23.872	+3.99
Average Procurement Unit Cost			
Cost	11869.0	12826.9	
Quantity	523	543	
Unit Cost	22.694	23.622	+4.09

Item	BY 2005 \$M	BY 2005 \$M	% Change
	Revised Original UCR Baseline (Nov 2004 APB)	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	10614.8	13010.2	
Quantity	512	545	
Unit Cost	20.732	23.872	+15.15
Average Procurement Unit Cost			
Cost	10435.1	12826.9	
Quantity	510	543	
Unit Cost	20.461	23.622	+15.45

# Unit Cost History



Item	Date	BY 2005 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	May 1998	9.283	8.840	10.316	9.909
APB as of January 2006	Nov 2004	20.732	20.461	23.725	23.483
Revised Original APB	Nov 2004	20.732	20.461	23.725	23.483
Prior APB	Nov 2004	20.732	20.461	23.725	23.483
Current APB	Apr 2010	22.957	22.694	25.974	25.745
Prior Annual SAR	Dec 2014	23.844	23.597	27.345	27.132
Current Estimate	Dec 2015	23.872	23.622	27.292	27.077

## SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.316	-0.491	3.003	-0.164	2.273	7.378	0.000	1.410	13.409	23.725

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
23.725	-0.173	0.285	-0.678	0.416	3.381	0.000	0.336	3.567	27.292



Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.909	-0.487	3.180	-0.171	2.282	7.354	0.000	1.416	13.574	23.483

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
23.483	-0.172	0.300	-0.680	0.417	3.392	0.000	0.337	3.594	27.077

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	Nov 1997	Nov 1997	Dec 1997
Milestone III	N/A	Jan 2004	Nov 2004	Nov 2004
FUE	N/A	Sep 2004	May 2007	Jul 2007
Total Cost (TY \$M)	N/A	3115.4	12147.4	14874.2
Total Quantity	N/A	302	512	545
PAUC	N/A	10.316	23.725	27.292

## Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	171.0	11976.4	--	12147.4
Previous Changes				
Economic	-0.9	-61.6	--	-62.5
Quantity	--	+1050.2	--	+1050.2
Schedule	--	-379.7	--	-379.7
Engineering	+0.5	+231.1	--	+231.6
Estimating	+1.0	+1857.3	--	+1858.3
Other	--	--	--	--
Support	--	+194.6	--	+194.6
Subtotal	+0.6	+2891.9	--	+2892.5
Current Changes				
Economic	--	-32.0	--	-32.0
Quantity	--	-112.2	--	-112.2
Schedule	--	+10.4	--	+10.4
Engineering	--	-4.7	--	-4.7
Estimating	--	-15.7	--	-15.7
Other	--	--	--	--
Support	--	-11.5	--	-11.5
Subtotal	--	-165.7	--	-165.7
Total Changes	+0.6	+2726.2	--	+2726.8
CE - Cost Variance	171.6	14702.6	--	14874.2
CE - Cost & Funding	171.6	14702.6	--	14874.2

Summary BY 2005 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	179.7	10435.1	--	10614.8
Previous Changes				
Economic	--	--	--	--
Quantity	--	+844.2	--	+844.2
Schedule	--	-58.5	--	-58.5
Engineering	+0.5	+187.3	--	+187.8
Estimating	+3.1	+1353.1	--	+1356.2
Other	--	--	--	--
Support	--	+169.9	--	+169.9
Subtotal	+3.6	+2496.0	--	+2499.6
Current Changes				
Economic	--	--	--	--
Quantity	--	-86.1	--	-86.1
Schedule	--	+5.8	--	+5.8
Engineering	--	-3.6	--	-3.6
Estimating	--	-11.1	--	-11.1
Other	--	--	--	--
Support	--	-9.2	--	-9.2
Subtotal	--	-104.2	--	-104.2
Total Changes	+3.6	+2391.8	--	+2395.4
CE - Cost Variance	183.3	12826.9	--	13010.2
CE - Cost & Funding	183.3	12826.9	--	13010.2

Previous Estimate: December 2014

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-32.0
Adjustment for current and prior escalation. (Estimating)	+18.4	+22.4
Quantity variance resulting from a decrease of five CH-47Fs from 548 to 543. (Subtotal)	-112.4	-146.4
Quantity variance resulting from a decrease of five CH-47Fs from 548 to 543. (Quantity)	(-86.1)	(-112.2)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(+5.8)	(+7.6)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(-3.6)	(-4.7)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(-28.5)	(-37.1)
Stretch-out of five CH-47Fs from FY 2017 to FY 2018. (Schedule)	0.0	+2.8
Adjustment to Engineering Change Orders due to funding reduction. (Estimating)	-1.0	-1.0
Adjustment for current and prior escalation. (Support)	+1.0	+1.4
Increase in Other Support to reflect actuals. (Support)	+0.2	+0.3
Decrease in Initial Spares to reflect actuals. (Support)	-10.4	-13.2
Procurement Subtotal	-104.2	-165.7

(QR) Quantity Related

## Contracts

### Contract Identification

**Appropriation:** Procurement  
**Contract Name:** Multiyear II  
**Contractor:** Boeing Helicopter  
**Contractor Location:** Philadelphia, PA 19142  
**Contract Number:** W58RGZ-13-C-0002  
**Contract Type:** Firm Fixed Price (FFP)  
**Award Date:** June 10, 2013  
**Definitization Date:** June 10, 2013

### Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
916.5	N/A	37	2840.8	N/A	105	2840.8	2840.8

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the increase in number of aircraft on contract and the application of Engineering Change Proposals.

### Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	407	407	543	74.95%
Total Program Quantity Delivered	409	409	545	75.05%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	14874.2	Years Appropriated	22
Expended to Date	11385.2	Percent Years Appropriated	91.67%
Percent Expended	76.54%	Appropriated to Date	13966.4
Total Funding Years	24	Percent Appropriated	93.90%

The above data is current as of February 09, 2016.

## Operating and Support Cost

### Cost Estimate Details

**Date of Estimate:** February 08, 2016  
**Source of Estimate:** POE  
**Quantity to Sustain:** 449  
**Unit of Measure:** Aircraft  
**Service Life per Unit:** 20.00 Years  
**Fiscal Years in Service:** FY 2007 - FY 2040

The O&S costs are taken from the the February 2016 Program Office Estimate (POE) which is based on methodology from the 2004 CH-47F Army Cost Position. It assumes an end state of 449 CH-47F operational aircraft when fully fielded flying 180 peacetime hours per aircraft per year. While the common production costs of 66 MH-47Gs are included in the procurement costs, they are excluded from the O&S costs as they are managed by the Special Operations Aviation Regiment. The remaining 30 CH-47F aircraft are RDT&E aircraft and peacetime attrition aircraft that incur no O&S costs due to no flying hours; or are wartime replacement aircraft whose flying hours are already accounted.

### Sustainment Strategy

The sustainment approach for the CH-47F is a blend of Government and Contractor Logistics Support in conjunction with the Supportability Strategy. There is a continued focus on reducing maintenance burden and O&S costs including the use of Performance Based Logistics when appropriate.

The CH-47D and CH-47F costs are based on CH-47D actuals extracted from the O&S Management Information System (OSMIS). To calculate the CH-47F costs, the CH-47D actuals were augmented by an improvement factor to account for the increased reliability of recapitalized parts, new airframe, and vibration engineering.

### Antecedent Information

The antecedent to the CH-47F is the CH-47D, for which the O&S costs are from the CH-47D model POE. The total O&S cost is based on 306 systems with an operating span of 20 years peacetime operating tempo spanning FY 1997 to FY 2018. The O&S costs are based on actuals extracted from OSMIS.

Annual O&S Costs BY2005 \$K		
Cost Element	CH-47F Average Annual Cost Per Aircraft	CH-47D (Antecedent) Average Annual Per Aircraft
Unit-Level Manpower	401.300	658.828
Unit Operations	69.500	76.408
Maintenance	1160.800	1208.797
Sustaining Support	19.700	470.291
Continuing System Improvements	208.900	11.359
Indirect Support	99.300	652.265
Other	0.000	0.000
Total	1959.500	3077.948

Item	Total O&S Cost \$M			
	CH-47F			CH-47D (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
<b>Base Year</b>	16379.4	18017.3	17596.3	18837.0
<b>Then Year</b>	22285.6	N/A	25068.3	N/A

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program.

#### Equation to Translate Annual Cost to Total Cost

Total cost = Average annual cost per aircraft \* quantity \* service life = \$1959.5K \* 449 \* 20 = \$17596.3M.

O&S Cost Variance		
Category	BY 2005 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2014 SAR	17659.2	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	-62.9	Post Production Modifications methodology change.
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-62.9	
Current Estimate	17596.3	

#### Disposal Estimate Details

**Date of Estimate:** February 08, 2016  
**Source of Estimate:** POE  
**Disposal/Demilitarization Total Cost (BY 2005 \$M):** Total costs for disposal of all Aircraft are 6.5